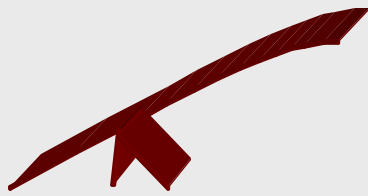


# **CMMI Assessment Experience With Medium and Small Companies**



**CMMI Technology Conference  
November 2001  
Denver, Colorado**



# Welcome

**WelKom**

**Huan Yín**

**Bienvenido**

**Bienvenue**

**Wilkommen**

**????S??S???**

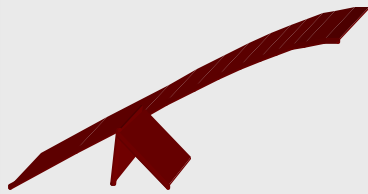
**Bienvenuto**

**Välkommen**

**Tervetuloa**

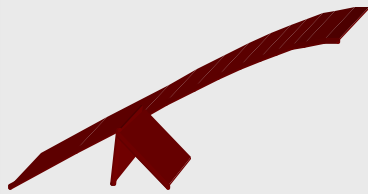
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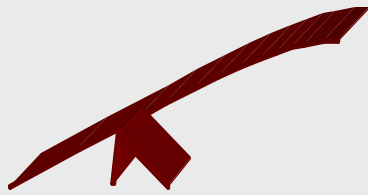
# Acknowledgement

- ◆ A special acknowledgement is given to my Dutch partner Simon Porro of SPI Partners who went through all of the trainings, assisted me in the first large assessment, and led the assessments of the two 4-person business units



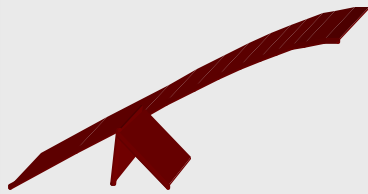
# Topics

- ◆ Goal of Assessment
- ◆ SCOPE of Assessment
- ◆ Assessment Team Composition Criteria
- ◆ SPI Awareness Briefing
- ◆ CMMI Training
- ◆ Action Focused Assessment Training  
(Enhanced SCAMPI)
- ◆ Choosing the Senior and Middle Managers



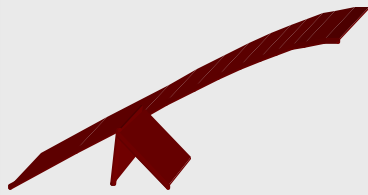
# Topics

- ◆ Completion of Pre-Assessment Questionnaires
- ◆ Reviewing Documented Processes Online
- ◆ Consolidating the Observations using NGT Voting
- ◆ Presenting the Assessment Results
- ◆ Sample schedule for the 4 person business unit



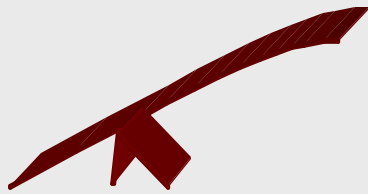
# Company Background

- ◆ CMMI-based assessments were conducted for AVL Graz Instrumentation Test Systems and four AVL Affiliates located in North America, India, Italy, and Germany
  - ≥ Graz – 130 developers
  - ≥ North America – 17 developers
  - ≥ India – 35 developers
  - ≥ Germany – 4 people
  - ≥ Italy – 4 people



# Goal of the CMMI-based Assessments

- ◆ The Goal of the CMMI-based assessments was to establish an AVL baseline of its software process capability based on the most up-to-date integrated CMM that is now being supported by the Software Engineering Institute



# Scope of the Assessment

Possible Investigation Levels:

- ◆ Deep level:

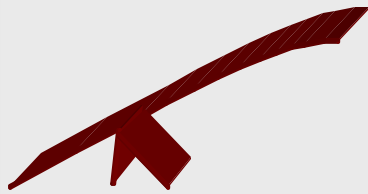
- ≥ A **reliable rating** for the Process Area can be established, based on the depth and the results of the investigation

- ◆ Intermediate level:

- ≥ all important areas of improvement are covered in the investigation. There is insufficient depth to establish a reliable rating.

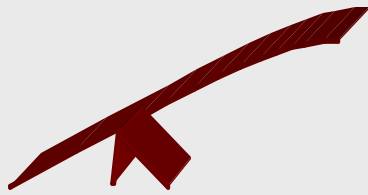
- ◆ Surface level:

- ≥ Obvious areas for improvement will be discovered, but there is no guarantee for completeness of findings



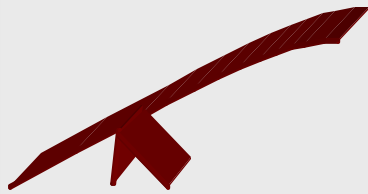
# Scope of the Assessment - 2

- ◆ The following list shows the depth range for each PA that was evaluated and the implications thereof:
  - ≥ Requirements Development (Deep – Intermediate - Surface)
  - ≥ Technical Solution (Intermediate – Surface).
  - ≥ Requirements Management (Deep – Intermediate)
  - ≥ Project Management – Project Planning and Project Monitoring and Control (Deep – Intermediate)
  - ≥ Project Integration, Verification, Validation (Intermediate – Surface)
  - ≥ Quality Management Support Functions – Process and Product Quality Assurance and Configuration Management (Intermediate – Surface)



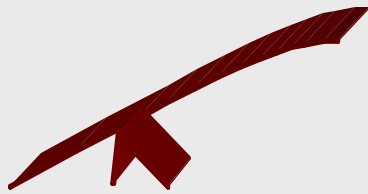
# Scope of the Assessment - 3

- ≥ Process Management – Process Focus, Process Definition – (Surface)
- ≥ Supplier Agreement Management (Surface – Not Examined)



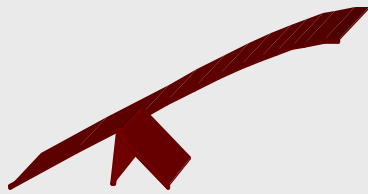
# Assessment Team Composition Criteria

- ◆ Assessment Team members should understand the business the organization is in and have an interest in seeing their organization improve its processes
- ◆ Assessment Team members must have a solid software engineering background, preferably with at least 10 years of software experience but no less than five
- ◆ The entire software lifecycle must be able to be covered by the collective experience of the assessment team
- ◆ One of the team members should have at least 6 years of management experience. The team as a whole should have at least 15 years of management experience.
- ◆ Some of the organizational assessment team members should truly understand the culture of the organization



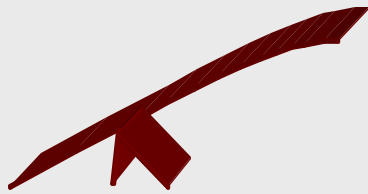
# Assessment Team Composition Criteria - 2

- ◆ At least one member of the assessment team must have easy access to the organization's Senior Management team
- ◆ Organizational team members should be selected to provide the best possible coverage of the business units domain and environment.
- ◆ The assessment team should include members that are comfortable with the concepts involved in Quality Assurance and Configuration Management
- ◆ Some of the assessment team members should have experience in measurement
- ◆ The organizational assessment team member's opinions and expertise are respected throughout the organization



# Assessment Team Composition Criteria - 3

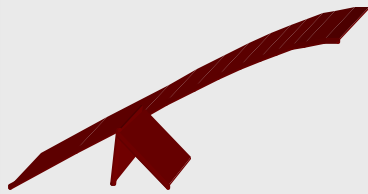
- ◆ Each assessment team member should be willing and able to work on an assessment team
- ◆ All assessment team members should have good people skills and be able to conduct interviews in a non-threatening manner
- ◆ At least one assessment team member should have strong presentation skills and experience in making presentations to senior management
- ◆ An assessment team member's presence on the Assessment Team should not inhibit anyone who will be interviewed from speaking comfortably about process issues
- ◆ The individual serving as the business unit coordinator should have good organizational skills and be able to communicate comfortably with all levels of management



# Assessment Team Composition Criteria - 4

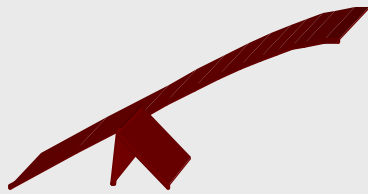
## ◆ What really happened?

- ≥ Lead Assessor was a Senior or Principal Consultant with Kasse Initiatives
- ≥ Assessment Team Coordinator was the same for all five sites
- ≥ Additional assessment team members were first chosen from process improvement or quality management job focus and interest
- ≥ Assessment Team Members who were also interviewed were normally done so in a private interview by the Lead Assessor and Assessment Team Coordinator



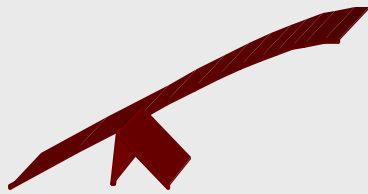
# Process Improvement Awareness Briefing

- ◆ Each AVL Business Unit that was scheduled for an assessment first had a Process Improvement Awareness Briefing delivered
  - ≥ Today's Situation in Software Engineering
  - ≥ Benefits of Focusing on Process Improvement
  - ≥ Process Improvement Concepts
  - ≥ Process Improvement Model
  - ≥ Process Management Concepts
  - ≥ CMMI Overview
  - ≥ Multiple Views of the CMMI
  - ≥ Managing Process Change
  - ≥ CMMI-based Assessment Goals
  - ≥ Action Focused Assessment Framework
  - ≥ Action Focused Assessment Flow



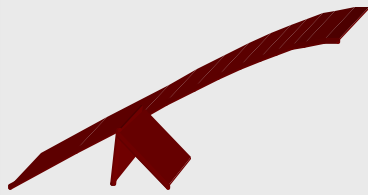
# CMMI Training

- ◆ All AVL business sites had core assessment team members who attended the SEI Intro to CMMI in Holland
  - ≥ Training included the standard 3 days + 1 day of detailed training for Engineering process areas
  - ≥ All core assessment team members then were required to go through 1 ½ days of detailed CMMI training for assessment team members
  - ≥ Core assessment team members filled out the KI Practice Questionnaire to ensure they could interpret any questions on this initial questionnaire
  - ≥ Site assessment team members who were not able to attend the detailed training received a crash training course on the first day of the assessment on-site period



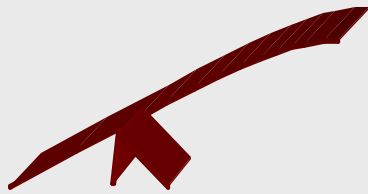
# AFA (Enriched SCAMPI) Assessment Training

- ◆ All core assessment team members went through a 2 ½ day CMMI-based assessment training course that included the principles of the ARC and the Action Focused Assessment
- ◆ All site assessment team members who were not able to attend this training went through a one-day crash course at the beginning of the on-site period



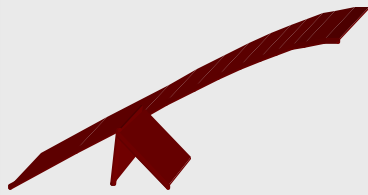
# Choosing the Senior and Middle Managers

- ◆ The Senior Manager of each AVL business unit that had a CMMI-based assessment was either the Executive Vice-President of Software Engineering or the President of that AVL business unit
- ◆ Middle Managers were normally the Head of Development (HOD)
- ◆ Some HOD's also served as the Project Leader when the site was very small



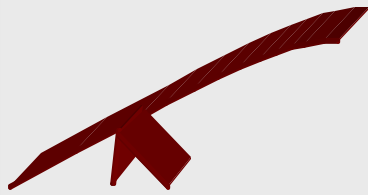
# Completion of Pre - Assessment Questionnaires

- ◆ Each business unit was required to fill out the following questionnaires
  - ≥ **Site Information Questionnaire** – The Site Information Questionnaire helps the assessment team to rapidly understand the culture and language of the site's software practitioners and the context within which they operate
  - ≥ **Change Readiness Questionnaire** – The Change Readiness Questionnaire assists an organization in determining its readiness for change



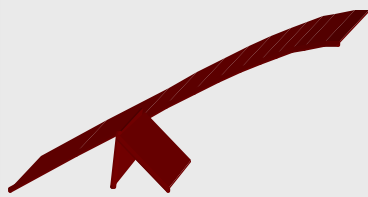
# Completion of Pre - Assessment Questionnaires - 2

- ≥ **Organizational Structure Questionnaire** – What is the real structure that gets things done? What is the communication structure? What is the relationship with the clients? How are the requirements gathered? Are there multiple customers? Are the customers internal or external? Are there end users involved?
- ≥ **The Project Questionnaire** – The Project Questionnaire is intended to help collect information for use in selecting projects or other work efforts. It helps the assessment team organize contextual background information.



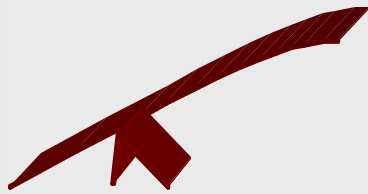
# Completion of Pre - Assessment Questionnaires - 3

- ≥ **Documented Process Questionnaire** – The Documented Process Questionnaire looks at all of the documented policies, procedures, standards, guidelines, and templates as well as the artifacts that exist from the use of those defined processes and maps them to the requirements of the CMMI



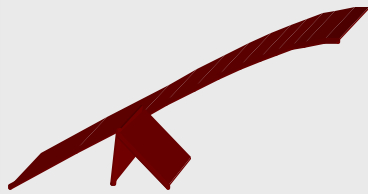
# Reviewing Documented Processes Online

- ◆ The KI historical database shows that it normally takes a team of 4-5 people about 4-5 days to review the documented processes for the process areas that will be examined and develop an overview presentation that is shared with the rest of the assessment team



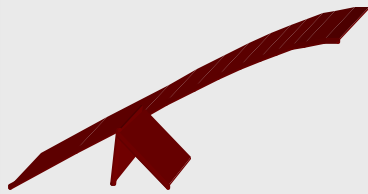
# Reviewing Documented Processes Online - 2

- ◆ KI has experimented with a different way of determining the existence, completeness, and usefulness of a business unit's processes when that documentation is available online
  - ≥ Schedule 1-2 days to review documentation – entire assessment team is present
  - ≥ Request that “process owners” or at least process lead developers present or “walk through” the specific process area processes



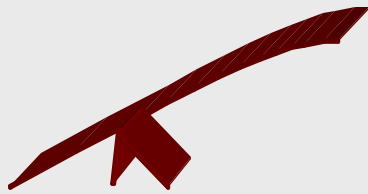
# Reviewing Documented Processes Online - 3

- ≥ Assessment team members may ask the following questions during the presentation:
  - ↑ Would you please clarify or expand on a point?
  - ↑ Would you please jump to the referenced procedure, guideline, template, or checklist?
  - ↑ Would you please show project examples that have followed that procedure or used that template?
  - ↑ Why was this information placed in this document and not another one that is more closely aligned to the CMMI way of organization?
  - ↑ Would you please print a hard copy of that section of the procedure or please print out the entire procedure?
  - ↑ .....



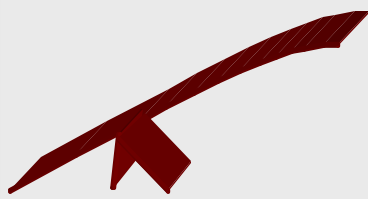
# Reviewing Documented Processes Online - 4

- ◆ Reviewing the documented processes online in that fashion accomplishes the following important things:
  - ≥ Reduces the time required to accomplish a detailed look at the documented processes
  - ≥ The ones presenting the process are experts in where important ideas are located within the document
  - ≥ Any issue can be required to be reviewed again with little loss of time
  - ≥ Follow-up on referenced procedures, guidelines, templates, and checklists is immediate
  - ≥ Contributes more quickly toward rating if this is one of the assessment goals



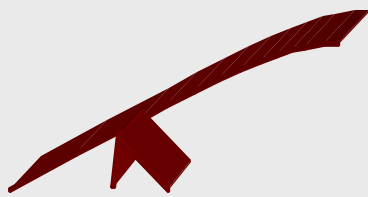
# Reviewing Documented Processes Online - 5

- ≥ Assessment team members can ask “interview-like” questions to gain more insight as to how these processes are actually being used on the projects
- ≥ Having “experts” describe their documented processes and other site assessment team members witnessing the answers eliminates or reduces the risk of long debates over the value of the documented processes in the later phases of the assessment



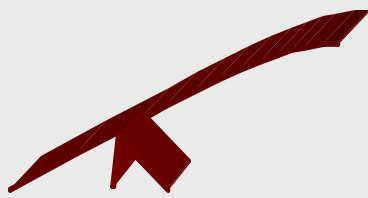
# Consolidating the Observations Using NGT Voting

- ◆ Each assessment team member reviews his/her own notes and makes observations
- ◆ These observations may make use of the sticky note format or may simply be placed on a sheet of paper with appropriate notations that will later be shared with the rest of the assessment team
- ◆ After each assessment team member has had a chance to develop individual observations, the Assessment Team Leader leads or facilitates the team in a brainstorming process to get the observation candidates out in front of the team
- ◆ A category is picked. The facilitator asks one person to offer a strength or weakness for that category



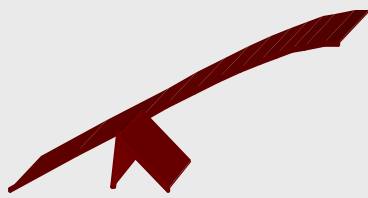
# Consolidating the Observations Using NGT Voting - 2

- ◆ An observation is offered and the facilitator writes it on a flip chart or white board
- ◆ The facilitator asks the next person for an input:
  - ≥ This next person looks at what has already been placed on the flip chart or white board and what observations they have written down for themselves
  - ≥ If an observation already written on the flip chart or white board is close enough, they either pass to the next person or offer an observation for that category that they feel is different enough to be considered by their teammates
- ◆ The facilitator continues in a “Round Robin” fashion. (each person gets a turn to offer one input for a category and this process continues until everyone has run out of new ideas)



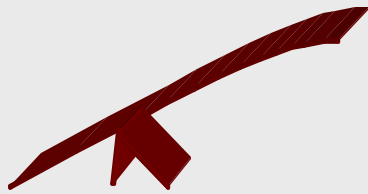
# Consolidating the Observations Using NGT Voting - 3

- ◆ The assessment team then “takes a step back” and reviews all of the observations again that are in front of them
- ◆ Like observations may be further consolidated with the consensus of the assessment team



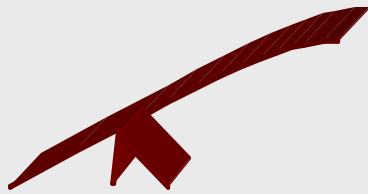
# Consolidating the Observations Using NGT Voting - 4

- ◆ NGT Voting Example – Suppose that the assessment team has come up with 15 separate “weak point” observations for Testing.
  - ≥ Assume that a reasonable number for Preliminary Findings Feedback is 8, the assessment team must reduce the number from 15 to 8
  - ≥ Each ATM can be given 4 votes. This means that each ATM must decide, in his/her opinion, which are the top 4 important findings facing the organization
  - ≥ After each ATM chooses his/her top 4, the facilitator counts the number of positive votes for each weakness
  - ≥ The 8 weaknesses that receive the most votes are the ones that are chosen by the assessment team to present as significant observations



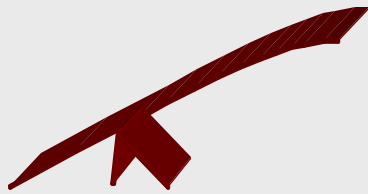
# Presenting the Assessment Results

- ◆ The approach chosen to present the assessment results for these CMMI-based assessments included:
  - ≥ Presenting the Goals of the assessment
  - ≥ Presenting the SCOPE of the assessment
  - ≥ Executive summary including strong process areas, weak process areas and general indication of the satisfaction of the Generic Practices
  - ≥ Presentation of the Generic Practices for the set of process areas that follow
  - ≥ Presentation of the process areas in terms of Plus Points, Weaknesses, Business Consequences, and Recommendations
  - ≥ Presentation of background of related process areas that were not assessed but may have a dependency with those that were part of the assessment SCOPE



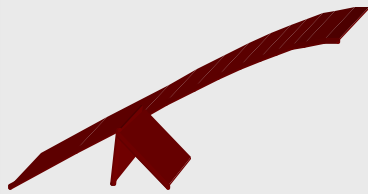
# Sample Schedule for 4 - Person Business Unit

- ◆ The standard SCAMPI assessment method was tailored to produce the following 4-day on-site schedule for the 4-person business unit
  - ≥ Kick Off Meeting
  - ≥ Practice Questionnaire was filled out by all interviewees
  - ≥ Response Analysis Spread Sheet was filled out
  - ≥ Senior Manager interview questions were selected from the interview question database
  - ≥ Senior Manager interview was conducted



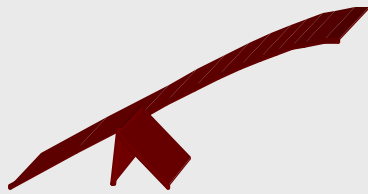
# Sample Schedule for 4 - Person Business Unit - 2

- ≥ Notes were tagged from Senior Management interview
- ≥ Middle Management interview questions were selected from the interview question database
  - ↑ Project Leader interview questions were also reviewed and combined with the middle manager questions for the Middle Manager that also served as a PL
- ≥ Middle Manager interview was conducted
- ≥ Assessment Team Members performed individual consolidation of notes



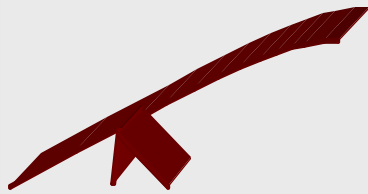
# Sample Schedule for 4 - Person Business Unit - 3

- ≥ Project Leader interview questions were selected from the interview question database
- ≥ Project Leader interviews were conducted
- ≥ Notes were tagged from Middle Manager and Project Leader interviews
- ≥ Practitioner interview questions were selected from the interview question database
- ≥ All software developers and project leaders were interviewed during the Practitioner interview
- ≥ Notes were tagged from the Practitioner interview



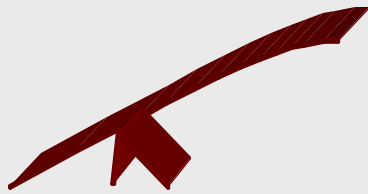
# Sample Schedule for 4 - Person Business Unit - 4

- ≥ NGT Voting was used to reduce observations to most significant for presentation to the Senior Manager
- ≥ Draft Findings Presentation was developed
- ≥ Draft Findings Presentation was presented to all interviewees except for the Senior Manager in one session
- ≥ Senior Management Presentation was made to the President of the business unit and all assessment participants



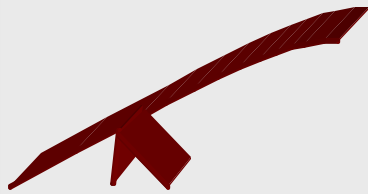
# Summary

- ◆ Conducting a CMMI-based assessment was accomplished through:
  - ≥ Rigorous training in the CMMI and solid training in the assessment approach
  - ≥ Precise definition of SCOPE
  - ≥ Reviewing the documented processes by using process champions to walk the assessment team through the process descriptions
  - ≥ Flexibility in determining who fulfilled the role of Senior and Middle Manager



## Summary - 2

- ≥ Willingness to combine roles such as Middle Manager and Project Leader
- ≥ Having a database of interview questions for all levels of interviews
- ≥ Using NGT Voting to speed up the consolidation of observations process
- ≥ Openness on the part of the small business unit to have results presented to them as a group with no distinction of title or position



# Tim Kasse Kasse Initiatives LLC

30 West Sheffield Avenue  
Gilbert, Arizona 85233  
U.S.A.

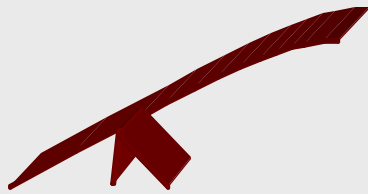
Tel: +1 480 855 1101

Niedereschacher Strasse 6  
78052 Villingen-Schwenningen  
Germany

Tel: +49 7721 407 851

**E-mail: [kassetc@aol.com](mailto:kassetc@aol.com)**

**Web Site: [www.kasseinitiatives.com](http://www.kasseinitiatives.com)**



## Simon Porro SPI Partners

Sprookjesbosch 53  
5629 JB Eindhoven  
The Netherlands  
Tel: +31.40.248.98.22,

**E-mail: [porro@spiparnters.nl](mailto:porro@spiparnters.nl)**  
**Web Site: [www.spipartners.com](http://www.spipartners.com)**